17420

21819

3 Hours / 100 Marks Seat No. | | | | | | | | |

Instructions – (1) All Questions are *Compulsory.*

(2) Answer each next main Question on a new page.

(3) Illustrate your answers with neat sketches wherever necessary.

(4) Figures to the right indicate full marks.

(5) Assume suitable data, if necessary.

(6) Use of Non-programmable Electronic Pocket Calculator is permissible.

(7) Mobile Phone, Pager and any other Electronic Communication devices are not permissible in Examination Hall.

Marks

1. a) **Attempt any SIX of the following:** **12**

(i) Define mineralogy and petrology.

(ii) Define the crust and write the thickness of crust for following mentioned areas:

1) Under the ocean

2) Under continents.

(iii) What do you mean by symmetrical folds and asymmetrical folds.

(iv) Define:

1) Fault

2) Folding

Marks

v) Define:

1) Porosity

2) Degree of saturation

vi) Write any two objectives of geotechnical engineering.

vii) Write any two uses of soil as construction material.

viii) Write the formula for density index with meaning of each term in the formula.

b) **Attempt any TWO of the following:** **8**

(i) Write any four importance of geology in Civil Engineering.

(ii) Explain different types of faults occurs in rocks.

(iii) Enlist field application of geotechnical engineering and explain any one.

2. Attempt any FOUR of the following: **16**

a) Define weathering and write the factors affecting weathering.

b) Enlist the physical properties of soil and explain any one of them.

c) Explain the formation process of soil.

d) Define earthquake and classify it on the basis of origin.

e) Write any two causes and effect of earthquakes.

f) Define:

(i) Consistency limit

(ii) Liquid limit

(iii) Plastic limit

(iv) Shrinkage limit

Marks

3. Attempt any FOUR of the following: **16**

a) Write any four uses of particle size distribution curve.

b) State Darcy's law of permeability and define coefficient of permeability.

c) A soil sample having 10 cm diameter and 15 cm long was tested under variable head permeameter. The initial water head was 45 cm and it was observed to be dropped to 30 cm in 195 sec. The burette diameter was found to be 1.9 cm. Calculate the coefficient of permeability in m/day.

d) Differentiate between cohesionless soil and purely cohesive soil.

e) Explain vane shear test carried out on given soil sample.

f) Write any four assumptions of Rankines theory made for non-cohesive soils.

4. Attempt any FOUR of the following: **16**

a) State and explain the failures of soil on the basis of terzaghi's analysis.

b) Write any four methods of improving bearing capacity.

c) Define compaction and write any three rollers used for compaction with their suitability.

d) Define CBR and write significance of CBR.

e) Write any four use of soil stabilization.

f) Enlist field indentification test on soil and explain dilatency test.

Marks

5. Attempt any TWO of the following: **16**

a) A soil sample of volume 160 cc , weight 310 gms, when partially saturated. It weight 269.28 gms when full dry sp. gravity of soil is 2.67 Determine porosity void ratio, water content and degree of saturation.

b) Write the laboratory procedure to determine the liquid limit by Casagrande's method with neat sketch.

c) Classify the soil according to IS classification and explain the meaning of following term:

(i) GW

(ii) SP

(iii) ML

(iv) SM-ML

6. Attempt any TWO of the following: **16**

a) Following readings were taken in a direct shear test:

Normal stress in N/mm^2	0.1	0.2	0.3	0.4
Shear stress at failure in N/mm^2	0.110	0.152	0.193	0.285

Determine the values of C and ϕ.

c) Explain the plate load test with sketch of reaction truss method.

d) State the step by step procedure for determination of OMC and MDD using standard proctor test and explain compaction curve.